

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion is respectfully requested.

Claims 1-20 and 22 are currently pending; Claims 1, 10, 12, 13, 16, and 17 are amended; and Claim 21 is cancelled by the present amendment.

The outstanding Official Action rejected Claim 21 under 35 U.S.C. § 101; rejected Claims 1, 2, 5, 10, 14, 15, 17, and 22 under 35 U.S.C. § 102(a) as being anticipated over World Intellection Property Organization Publication No. 02/275082 to Sharp; rejected Claims 12, 16, and 18-21 under 35 U.S.C. § 102(b) as being anticipated by the publication “Self Organization of a Massive Document Collection” to Kohonen et al. (hereinafter Kohonen); rejected Claims 3, 4, and 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Sharp in view of Kohonen; rejected Claim 11 under 35 U.S.C. § 103(a) as unpatentable over Sharp; rejected Claim 11 under 35 U.S.C. § 103(a) as unpatentable over Sharp; rejected Claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Kohonen in view of the publication “Sequential Learning for SOM Associative Memory with Map Reconstruction” to Hattori and “An Instantaneous Topological Mapping Model for Correlated Stimuli” to Jockusch.

Applicants submit that the rejection of Claim 21 under 35 U.S.C. § 101 is rendered moot by the present amendment.

In light of the rejections on the merits of the claims, Claim 1 is amended to recite “said graphical user interface also concurrently displaying a list of data representing information items, being those information items being mapped into notes corresponding to display points displayed within said two dimensional region of said display area.” Support for this amendment is found in Applicants’ Figure 7 and the corresponding written

description in the specification. Claim 17 is amended to recite an analogous feature. The remaining changes to the claims address minor informalities. Thus, no new matter is added.

Briefly recapitulating, Claim 1 is directed to an information retrieval system in which a set of distinct information items map to respective nodes in an array of nodes by mutual similarity of the information items, so that similar information items map to nodes at similar positions in the array of nodes. The system includes a graphical user interface for displaying a representation of at least some of the nodes as a two-dimensional display array of display points within a display area on a user display. The system includes a user control for defining a two-dimensional region of the display area. The system further includes a detector for detecting those display points lying within the two-dimensional region of the display area. Additionally, the graphical user interface also concurrently displays a list of data representing information items, which are those information items mapped onto nodes corresponding to display points displayed within the two-dimensional region of the display area.

In a non-limiting example, Applicants' Figure 1 illustrates a processor 70 connected to a monitor 60 for performing the functions of Applicants' claimed graphical user interface, user control, and detector. Applicants' Figure 7 illustrates an example graphical user interface display with the nodes 290 displayed in a window 270, and a list of data 280, displayed in window 260, representing information items displayed in window 270.

According to one advantage of Applicants' claimed invention, by concurrently displaying the list along with the nodes, a user can more quickly refine a search for the mapped information items. Accordingly, the user of the system would be able to conduct quicker searches through large amounts of content. This solution is provided by using some of the screen to display the list concurrently with the defined region. Applicants submit that one of ordinary skill in the art would not consider adapting the applied references in this way

because to do so would reduce the size of the map on the screen, which would be considered to reduce the clarity of the map and therefore, would not be obvious.

Turning now to the applied reference, Sharp describes a system and method for displaying search results from a search of a database by using a graphical user interface (GUI). Figure 1 of Sharp illustrates a database 102 for storing content items. Sharp describes the database as a standard database in which items of content are associated with one or more keywords.¹ Sharp describes that representations of data items are arranged on a graphical display such that a spatial relationship between the data items represents a relationship between two or more qualitative attributes associated with those data items.² Sharp describes that a quality attribute generator 104B module is used to calculate qualitative attributes from the data stored in the database and output coordinates of each individual record within the database so that the attributes may be displayed on the GUI.³ Figure 2 of Sharp illustrates quality attributes 208 plotted on a graph 206.

Sharp further describes that the GUI includes playback and collection tools, which allow a user to select content items returned by a search tool and add them to a collection bin. The collection bin is presented as a set of thumbnail images, with each thumbnail representing an individual content item.⁴ Referring to Figure 1 of Sharp, the applied reference describes that these thumbnail images are stored in a storage device 106.⁵

Claim 1 is distinguishable over Sharp as the applied reference fails to disclose or suggest a *graphical user interface also concurrently displaying a list of data representing information items, being those information items mapped onto said nodes corresponding to display points displayed within said two-dimensional region of said display area*. The outstanding Official Action identifies the GUI of Sharp as Applicants' claimed *graphical*

¹ See Sharp at page 8, lines 3-4.

² See Sharp at page 3, lines 23-26.

³ See Sharp at page 5, lines 30-32.

⁴ See Sharp at page 3, lines 11-14.

⁵ See Sharp at page 6, lines 11-13.

user interface, and identifies the collection bin of Sharp as Applicants' claimed *displaying a list of data representing information items*.⁶

As discussed above, Sharp describes that the collection bin is presented as a set of thumbnail images. Sharp merely describes that the thumbnail images are stored in the storage device 106. However, Sharp fails to disclose that when data is retrieved from the database and qualitative attributes associated with the data are displayed on the GUI of Sharp, the thumbnail images are displayed *concurrently* with the qualitative attributes on the GUI of Sharp, as required by amended Claim 1.

Furthermore, Sharp describes with respect to Figures 8 and 9 of Sharp, that a zooming tool may be used to zoom in on the qualitative attributes displayed in the GUI of Sharp. However, Sharp fails to disclose or suggest that the thumbnail images are *concurrently* displayed on the GUI with the quality attributes that are zoomed-in.

Claim 1 is further distinguishable over Sharp as the applied reference fails to disclose or suggest that *a set of distinct information items map to respective nodes in an array of nodes by mutual similarity of said information items, so that similar information items map to nodes at similar positions in said array of nodes*. As discussed above, Sharp merely describes that the attribute generator generates coordinate data for information items as opposed to mapping similar information items to nodes at similar positions within an array of nodes as required by Claim 1.

Applicants submit that for one of ordinary skill in the art in the field of machine learning and self organizing maps, the term "nodes" is associated with a particular meaning. That is, in an array of nodes, each node is associated with an information item such that the map can be trained in accordance with training data. Therefore, the nodes of a self organizing map are different from the output coordinates of an attribute generator, as

⁶ See Office Action of May 17, 2007 at pages 3-4.

described in Sharp, whose coordinate data merely indicates where an information item should appear on a GUI.

Accordingly, Applicants submit that Sharp fails to disclose or suggest all the features of Claim 1 as amended. Thus, Applicants respectfully request that the rejection of Claim 1, and the claims depending therefrom, under 35 U.S.C. § 102(a) be withdrawn.

As independent Claim 17 is amended to recite features analogous to Claim 1, Applicants submit that Sharp fails to disclose or suggest all the features of independent Claim 17 as amended. Thus, Applicants respectfully request that the rejection of independent Claim 17, and the claims depending therefrom, under 35 U.S.C. § 102(a) be withdrawn.

Claim 12 is directed to an information storage system in which a set of distinct information items are processed so as to map to respective nodes in an array of nodes by mutual similarity of the information items, such that similar information items map to nodes at similar positions in the array of nodes. The system includes a generator configured to generate a feature vector derived from each information item, where the feature vector for an information item represents a set of frequencies of occurrence, within that information item, of each of a group of information features. The system further includes mapping logic configured to map each feature vector to a node in the array of nodes, where the mapping between information items and nodes in the array includes a dither component so that substantially identical information items tend to map to closely spaced but different nodes in the array.

Applicants submit that by using a dither component, as required by Claim 12, the need to recalculate the map when new information items are added or the need to use a high density of output nodes, which is computationally expensive, is reduced.⁷

⁷ See specification at page 10, lines 17-21.

Turning now to Kohonen, the applied reference describes using an algorithm disclosed in Kohonen, to create a self-organizing-map (SOM). Kohonen describes that each node in the SOM has a model vector and a content has a content vector x . The content is mapped to the node whose model vector is closest (in terms of Euclidean distance) to that content's vector x .⁸ Thus, two information items having similar areas of content will be mapped to the same node in the SOM of Kohonen.

Kohonen further describes using this algorithm to create a document map of electronic patent abstracts. Figures 5 and 6 of Kohonen show example documents maps created by the algorithm described in Kohonen. Figures 5 and 6 also illustrate enlarged windows showing a set of documents mapped to particular nodes.

Claim 12 is distinguishable over Kohonen as the applied reference fails to disclose or suggest that *mapping between information items and nodes in the array includes a dither component so that substantially identical information items tend to map to closely spaced but different nodes in the array*. As discussed above, Kohonen describes mapping content with similar information to the same node. That is, two information items similar in content will most likely have the shortest Euclidean distance to the same node and will therefore be mapped to that node. Applicants submit that if two information items are mapped to the same node, where corresponding pieces of content are extremely similar or identical as described above, a user would be unable to distinguish between the information items in Kohonen.

The outstanding Official Action asserts that Figure 6 of Kohonen "teaches items closely spaced but in different areas," which correspond to Applicants' claimed *dither component*.⁹ With respect to Figure 6, Kohonen describes that after performing a search query of a document map, the best matches to the search query are displayed as circles on the

⁸ See Kohonen at page 575, equation 2.

⁹ See Official Action of May 17, 2007 at page 6.

map and the relevance of those information items to the search query is shown by the size of the circle.¹⁰

However, the document map illustrated in Figure 6 is created using the method discussed above where information items with similar content are mapped to the same node. Even though Figure 6 shows an enlarged view of documents closely spaced but in *different areas*, as acknowledged by the outstanding Official Action, Kohonen neither discloses nor suggests that these documents are mapped to *closely spaced but different nodes* as required by Claim 12. Since Kohonen describes that information items with similar content are mapped to the same node, the documents illustrated as closely spaced but in *different areas* are mapped to the same node.

Furthermore, Kohonen describes using a random projection of word histograms to obtain better accuracy of document classification than word category mapping.¹¹ The purpose of this randomization is to speed up document classification by decreasing the dimensionality of the document vectors ($x_1 = Rn_i$).¹² In other words, this randomization method determines how quickly the map is formed rather than how well the map is formed. Thus, the use of a randomization vector R to speed up document classification is entirely different from the use of a deliberately introduced dither component that is less than or equal to half the node separation that allows substantially identical information items to map to closely spaced but different nodes in the array, as required by Claim 12.

Accordingly, Applicants submit that Kohonen fails to disclose or suggest all the features of Claim 12 as amended. Thus, Applicants respectfully request that the rejection of Claim 12, and the claims depending therefrom, under 35 U.S.C. § 102(b) be withdrawn.

As independent Claim 16 recites features analogous to Claim 12, Applicants submit that Sharp fails to disclose or suggest all the features of Sharp. Thus, Applicants respectfully

¹⁰ See Kohonen at page 584.

¹¹ See Kohonen at page 577, section D.

¹² See Kohonen at page 577, section C.

request that the rejection of Claim 16, and the claims depending therefrom, under 35 U.S.C. § 102(b) be withdrawn.

The outstanding Official Action rejected Claims 3, 4, and 6-9 under 35 U.S.C. § 103(a) as unpatentable over Sharp and Kohonen.

As discussed above, Sharp fails to disclose or suggest all the features of Claim 1, which Claims 3, 4, and 6-9 depend therefrom. As Kohonen fails to cure the deficiencies of Sharp, Applicants submit that a *prima facie* case of obviousness has not been presented for Claims 3, 4, and 6-9.

Accordingly, Applicants respectfully request that the rejection of Claims 3, 4, and 6-9 under 35 U.S.C. § 103(a) be withdrawn.

Claim 9, which depends from Claim 1, recites that "said mapping between information items and nodes in said array includes a dither component so that substantially identical information items tend to map to closely spaced but different nodes in said array." Applicants submit that the combination of Sharp and Kohonen teaches away from Applicants' claim 9 for the following reasons.

The courts held that "[a] reference may be said to teach away when a person of ordinary skill in the art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994). To this end, "disclosures in the references that diverge from and teach away from the invention cannot be disregarded," Phillips Petroleum Company v. U.S. Steel Corp., 9 U.S.P.Q.2d 1461 (Fed. Cir. 1989).

In contrast to both Sharp and Kohonen, Applicants' claimed invention as recited by Claim 1, concurrently displays the region and the list. This feature allows for quicker searching of content. Additionally, Applicants claimed dither component ensures that, if the

same piece of content is input into this system two or more times, then each instance of the information items relating to the content will be mapped to a different coordinate or node. As discussed above, Kohonen fails to disclose or suggest this feature since the method in Kohonen merely maps all instances of information items relating to the same pieces of content to the same node.

Applicants submit that the advantages of including Applicants' claimed dither component is disclosed on page 10, line 22 to page 11, line 10 of the specification with reference to Applicants' Figure 6. In particular, Claims 9 and 12 recite mapping of information items in which "substantially identical information items are mapped to closely spaced but different nodes in the array." This claimed feature allows "multiple very similar items to be distinguishable over a single item at a particular node." (page 10, lines 29-30).

In contrast to Claims 9 and 12, under the systems described in Sharp and Kohonen, if multiple documents were mapped to the same coordinate or node, then the user would have to select a particular coordinate or node and then additionally select, via some other means (such as the zooming function described in Sharp), to distinguish between one of multiple documents he wishes to access. Due to this additional step, one of ordinary skill in the art would be discouraged from using Applicants' claimed dithering component with the combination of Sharp and Kohonen.

Accordingly, Applicants submit that a *prima facie* case of obviousness has not been presented for Claim 9. Thus, Applicants respectfully request that the rejection of Claim 9 under 35 U.S.C. § 103(a) be withdrawn on this independent ground.

The outstanding Official Action rejected Claim 11 under 35 U.S.C. § 103(a) as unpatentable over Sharp. As discussed above, Sharp fails to disclose or suggest all the features of Claim 1 as amended, which Claim 11 depends therefrom.

Accordingly, Applicants submit that a *prima facie* case of obviousness has not been presented for Claim 11. Thus, Applicants respectfully request that the rejection of Claim 11 under 35 U.S.C. § 103(a) be withdrawn.

The outstanding Official Action rejected Claim 13 under 35 U.S.C. § 103(a) as unpatentable over Kohonen in view of Hattori and Jockusch.

As discussed above, Kohonen fails to disclose or suggest all the features of Claim 12, which Claim 13 depends therefrom. As Hattori and Jockusch fail to cure the deficiencies of Claim 12, Applicants submit that a *prima facie* case of obviousness has not been presented for Claim 13.

Accordingly, Applicants respectfully request that the rejection of Claim 13 under 35 U.S.C. § 103(a) be withdrawn.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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